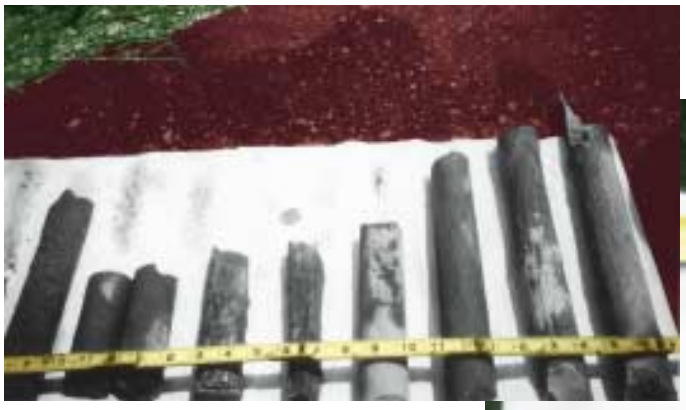
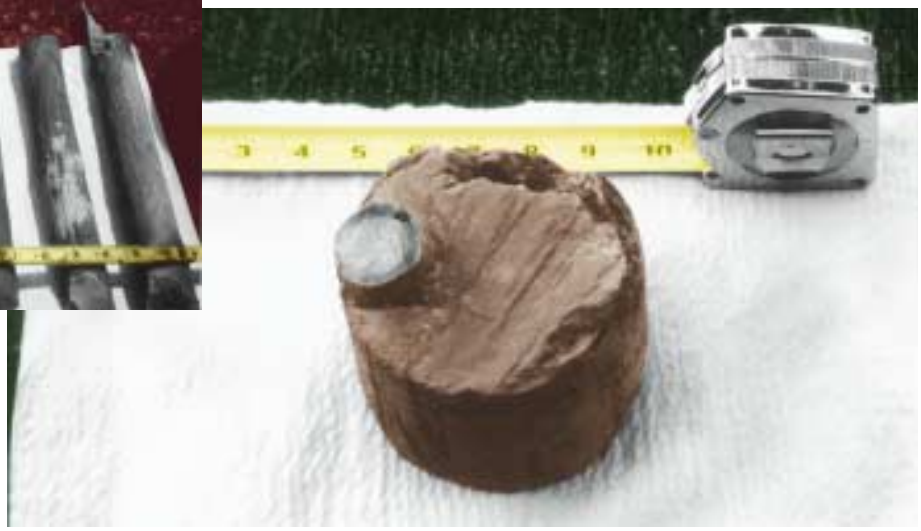
Tri-Service SCAPS Grouting Capability

Preventing Cross-Layer Contamination





The Tri-Service SCAPS provides real time site characterization, through cone penetrometer platform-deployed sensors/ samplers, that detect contamination in the subsurface. The grouting capability of SCAPS seals the penetrometer push holes, preventing subsurface seepage and cross-layer contamination.

The Tri-Service Site Characterization Analysis and Penetrometer System (SCAPS) reduces traditional site characterization costs by optimizing the placement of monitoring wells and soil borings at a given site as well as monitoring remediation activities. The SCAPS combines a truck-mounted cone penetrometer platform with various deployable chemical and physical sensors. It is crucial to ensure that the use of the deployable sensors/samplers does not create a conduit for contamination to spread in the subsurface. In order to prevent seepage and cross-layer contamination, the penetrometer holes are grouted upon completion of a push.

USAEC Environmental Technology Division

USAEC - ETD • Aberdeen Proving Ground, • Maryland 21010-5401 1-800-USA-3845
t2hotline@aec.apgea.army.mil

Preventing Subsurface Seepage and Cross-Layer Contamination

SCAPS combines traditional cone penetrometer technology with contaminant sensors/samplers to quickly and inexpensively provide a subsurface profile of contamination and soil layering, or stratigraphy. A hydraulically operated 20-ton truck-mounted cone penetrometer "pushes" these sensors/samplers into the ground, leaving a penetration hole through the subsurface.

Although this penetration hole is extremely small, with a diameter of less than two inches, it is a virtual avenue for hazardous waste materials to enter into uncontaminated subsurface layers and groundwater aquifers. This causes spreading of the contamination and compounds to create an even larger problem. SCAPS grouting capability can alleviate these concerns by preventing subsurface seepage and cross-layer contamination during site characterization, continued monitoring, and remediation activities.

The SCAPS LIF, resistivity, LIBS, stratigraphy, and Explosives Sensor probes can grout their penetration as they retract back to the surface through a technique called "expendable tip" grouting. As the penetrometer rods are retracted from the subsurface, a tailored mixture of cement, bentonite, and water is pumped through an internal tube down to the bottom rod. The grout pressure blows off an expendable tip, and the grout flows into the open hole, thereby sealing the hole and preventing subsurface seepage and cross-layer contamination.

Since the grouting capability is not currently incorporated into the HydroSparge Sensor, Thermal Desorption Sampler, and XRF Sensor, it is necessary to employ open hole or re-entry grouting techniques instead. These grouting techniques are used to seal the penetration hole upon the completion of a push.

The ability of SCAPS to grout the sensor penetrations allows SCAPS users to accomplish rapid site characterizations, continued monitoring, and remediation activities without fear of causing cross-layer contamination or allowing seepage of contamination to subsurface layers or groundwater.

Solutions

For more information on USAEC-ETD technology programs please call the:

Army Environmental Hotline
1-800-USA-3845 or email:
t2hotline@aec.apgea.army.mil